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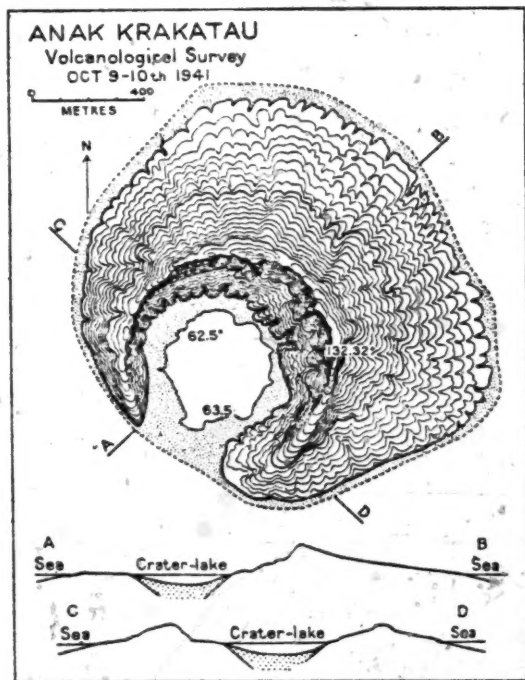


FIG. 4.—Detail of a Volcanic Island in the East Indies

reflecting at once the influence and forms of continental Asia and continental Australia, and of the Indian and Pacific Oceans.

ROCK TYPES

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133 Profound chemical action caused by tropical and equatorial weathering has two effects on most of Southeast Asia; the destruction of readily accessible fossils by weathering and the concealing of native rocks by great thicknesses of weathered material. Thus the historical geology of Southeast Asia, the dating of the rocks, is not yet fully studied, and the geological interpretations of local rocks are by no means unanimous.

So far as their general character is concerned, however, no appreciable difference can be noted between the rocks of Southeast Asia and those of more intensively studied areas in Europe and North America. The effects of each rock type in conditioning landscape forms appear to be much the same throughout the world, differing in degree, not in character.

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The pattern of rock types may be summed up thus :

1. Within the Sunda Platform quartzites and shales are prominent over large areas, generally producing subdued relief, not closely allied to the fold lines of the strata. These metamorphics often appear at the surface close to a group of limestone rocks of which a calcareous shale, much of it in areas of low elevation, is most extensive. Massive limestone is most common as a landscape feature where least subject to solution weathering,

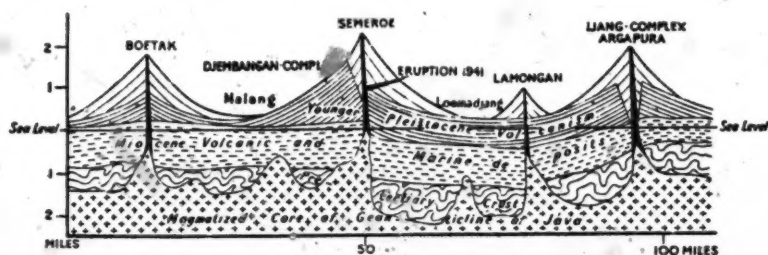


FIG. 5.—Schematic West-East Section of the Mountain Structures in Malang

towards the drier margins of the Platform (as in East Java and Tonkin) where it stands out as gaunt hills whose features recall those of the Karst, though partly disguised by a wilder profusion of vegetation. Small, slightly metamorphosed limestone formations retain this karstic character even under equatorial rains, as in North Malaya where they still rear prominently above the horizon. A large part of Borneo, the biggest single exposure of the Platform, is built of old sandstone, establishing a flat-topped landscape through which ravine-like valleys have been cut. The higher mountains of the Sunda Platform, the Altaids of Suess, are invariably elongated intrusions of igneous rock, mainly granitic, and this material forms the chief heights of a relief otherwise gently modulated.

2. Upon the young mountain systems marginal to the Platform, the landform owes more to recent tectonic activity than to the nature of the constituent rocks, most of which are also represented on the Sunda Platform. Complex fracturing and folding produce on the young mountains a wild steep landscape which here and there encloses fragments of older continental blocks. The vents and caldera of volcanoes (Fig. 5) add their special forms built from looser, easily eroded rock materials of lava

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135 type which have been severely scarred by denudation. Magmatic rocks have flowed extensively from these volcanoes, spreading over a large area and serving to mask relief forms developed upon underlying earlier structures. As a result of these igneous formations throughout the region, contact metamorphism has taken place on a large scale, which has a major bearing on the frequency of metallic minerals and helps to account for the scarcity of coal formations.

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134 3. The detail of much of the Southeast Asia landscape is conditioned by contemporary river alluviation and coastal sedimentation (as in Eastern Sumatra and South Borneo) whose thickness and profusion relate to the rapidity of tropical erosion on the one hand and to the stability of the continental platform on the other. Relief upon the great alluviated landscapes is slight. In this zone where there is so much coastline in proportion to the land area, marine accumulations of spits, bars and off-shore beaches are both prominent and important in conditioning coastal topography and the location of settlements. Marine loads tend to be heavy in this zone of violent terrestrial erosion and under certain conditions sediment accumulates quickly owing to the speed with which mangrove establishes itself upon any bank or spit which is built up, thereafter further hastening deposition by hindering the free scouring of normal wave action. Marine sedimentation is greater upon the inner coasts of the Sunda Platform and less upon those coasts facing the Indian and Pacific Oceans where the shore profiles are steep and the waves have maximum fetch.

CHARACTER OF SEAS

- 133 Three types of seas may be distinguished by the criterion of depth:

1. Shallow seas of the Sunda Platform
2. Shallow seas of the Sahul Shelf
3. The Austro-Asiatic "mediterranean" basins between the Sunda Platform and the Sahul Shelf, and subdivided by island festoons. In this group may be provisionally placed the Sulu Basin, though the South China Basin between the Philippines and the Asiatic mainland may only be included by considerably stretching the "mediterranean" conception.